IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

Nobuyuki Enomoto, et al.

Serial No.: 10/642,481 **Group Art Unit:** 2442

Filed: August 18, 2003 **Examiner:** Biagini, Christopher D.

For: NETWORK SYSTEM, LEARNING BRIDGE NODE, LEARNING METHOD AND ITS PROGRAM

Honorable Commissioner of Patents
Alexandria, VA 22313 – 1450

APPELLANTS' BRIEF ON APPEAL

Sir:

Appellants respectfully appeal the rejection of claims 3-5, 7-9, 11-14, 18-20, 22-24, 26-29, 33-35, 37-39, and 41-44 in the Office Action dated January 29, 2010. A Notice of Appeal was timely filed on June 25, 2010.

I. REAL PARTY IN INTEREST

The real party in interest is NEC Corporation, assignee of 100% interest of the above-referenced patent application.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, Appellants' legal representative or Assignee which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 3-9, 11-15, 18-24, 26-30, 33-39, and 41-45 are pending in this Application. Claims 6, 15, 21, 30, 36, and 45 were previously withdrawn.

Claims 3-5, 7-9, 11-14, 18-20, 22-24, 26-29, 33-35, 37-39, and 41-44 stand rejected under 35 U.S.C. § 112, first paragraph. Claims 3-5, 7-9, 11-14, 18-20, 22-24, 26-29, 33-35, 37-39, and 41-44 stand rejected under 35 U.S.C. § 112, second paragraph.

Claims 3-5, 7-9, 12, 13,18-20, 22-24, 27, 28, 33-35, 37-39, 42, and 43 stand rejected under 35 U.S.C. §103(a) as being unpatentable over ANSI/IEEE std.802.1D, 1998 Edition (hereinafter "the 802.1D specification") in view of Viswanath (US Patent No. 6,151,322). Claims 11, 14, 26, 29, 41, and 44 stand rejected under U.S.C. §103(a) as being unpatantable over the 802.1D specification in view of Viswanath, and further in view of Liu et al. (US 2002/0191628, hereinafter "Liu").

The rejections for claims 3-5, 7-9, 11-14, 18-20, 22-24, 26-29, 33-35, 37-39, and 41-44 are being appealed, in the format of the three issues identified below.

IV. STATUS OF AMENDMENTS

A Request for Reconsideration under 37 CFR §1.116 was filed on May 28, 2010. In the Advisory Action mailed June 11, 2010, the Examiner indicated that the arguments in the Amendment under 37 CFR §1.116 were not persuasive and that the rejection was maintained. A Notice of Appeal was filed on June 25, 2010.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Appellants' invention, as defined by exemplary claim 3, is directed to a network system for a network having plural nodes connected.

A node belonging to the network system includes a CPU (Central Processing Unit) executing a learning frame management unit which refers to a source media access control address (MAC SA) table cache to determine whether a learning frame transmission request of

a MAC SA has been made, and a memory system that stores a MAC forwarding table memory which stores an output port for a destination MAC address and destination tag information corresponding to a virtual local area network (VLAN) tagged Ethernet frame.

The destination tag information is included in a learning frame that the network transmits to a path opposite to another path in which a main signal frame flows, and the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request. The main signal frame includes source MAC address and the destination MAC address.

Accordingly, in the claimed invention, the destination tag information is included in a learning frame that the network transmits to a path opposite to another path in which a main signal frame flows, and the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request. The main signal frame includes source MAC address and the destination MAC address (e.g., see Application at Figs. 38-40; page 62, lines 10-13; page 113, lines 24-28, page 114, lines 11-14).

With this arrangement, the invention assigns a VLAN tag for every destination address. For example, when communicating between a subscriber (A) and ISP (B), the tag corresponding to the subscriber (A) of an address is added to the frame transmitted to a subscriber (A) from ISP (B), and the tag corresponding to ISP (B) of an address is added to the frame transmitted to ISP (B) from a subscriber (A).

For this reason, it is necessary to determine the tag which should be added on a destination MAC address. That is, mapping between a destination MAC address and a tag is needed. Therefore, the invention creates the mapping table (MAC forwarding table memory) of a destination MAC address and the tag which should be added by transmitting a learning frame so that such mapping can be performed automatically.

With the claimed features, even when the asymmetrical flow is flown by sending the learning frame through a path opposite to the path where the main signal frame flows, the learning process can be functioned, the network congestion can be remedied from becoming congestion, and the bandwidth usability can be improved (e.g., see Application at page 113, lines 13-18). Further, because the tag information is included in the learning frame, the setting of the forwarding tag to be added can be automated (e.g., see Application at page 114, lines 15-18).

The locations within the specification and figures of the claimed invention for the independent claims being argued separately are as follows:

3. (Rejected) A network system for a network having plural nodes connected, wherein a node belonging to said network comprises (Fig. 1; page 4, lines 8-11):

a CPU (Central Processing Unit) executing a learning frame management unit which refers to a source media access control address (MAC SA) table cache to determine whether a learning frame transmission request of a MAC SA has been made (Fig. 2; page 4, lines 12-16); and

a memory system that stores:

a MAC forwarding table memory which stores an output port for a destination MAC address and destination tag information corresponding to a virtual local area network (VLAN) tagged Ethernet frame, said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows (Figs. 38-40; page 4, lines 12-16; page 62, lines 10-13; page 109; line 25 – page 110, line 1; page 113 lines 13-27; and page 114, lines 11-14); and

the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address (Figs. 38-40; page 4, lines 12-16; page 5, lines 5-12; page 62, lines 10-13; page 109; line 25 – page 110, line 1; page 113 lines 13-27; and page 114, lines 11-14).

18. (Rejected) A learning bridge node of a network having plural nodes connected, said learning bridge node comprising (Fig. 1; page 3, line 25 – page 4, line 2):

a CPU (Central Processing Unit) executing a learning frame management unit which refers to a source media access control address (MAC SA) table cache to determine whether a learning frame transmission request of a MAC SA has been made (Fig. 2; page 4, lines 12-16); and

a memory system that stores:

a MAC forwarding table memory which stores an output port for a destination MAC address and destination tag information corresponding to a virtual local

area network (VLAN) tagged Ethernet frame, said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows (Figs. 38-40; page 4, lines 12-16; page 62, lines 10-13; page 109; line 25 – page 110, line 1; page 113 lines 13-27; and page 114, lines 11-14); and

the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address (Figs. 38-40; page 4, lines 12-16; page 5, lines 5-12; page 62, lines 10-13; page 109; line 25 – page 110, line 1; page 113 lines 13-27; and page 114, lines 11-14).

33. (Rejected) A learning method of a network having plural nodes connected, wherein a node belonging to said network uses a CPU (Central Processing Unit) to (Fig. 1; page 4, lines 8-11):

refer to a source media access control address (MAC SA) table cache to judge whether a learning frame transmission request of a MAC SA has been made (Figs. 38-40; page 4, lines 12-16; page 62, lines 10-13; page 112, lines 21-26; page 113, lines 13-18; and page 114, lines 11-14), and

store the MAC SA which has made a learning frame transmission request in said MAC SA table cache (Figs. 38-40; page 4, lines 12-16; page 62, lines 10-13; page 109; line 25 – page 110, line 1; page 113 lines 13-27; and page 114, lines 11-14), and

store an output port for a destination MAC address and a destination tag information corresponding to a virtual local area network (VLAN) tagged Ethernet frame in a MAC forwarding table memory, said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows, said main signal frame having a source MAC address and said destination MAC address (Figs. 38-40; page 4, lines 12-16; page 5, lines 5-12; page 62, lines 10-13; page 109; line 25 – page 110, line 1; page 113 lines 13-27; and page 114, lines 11-14).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants present the following issue for review by the Board of Patent

Appeals and Interferences:

ISSUE #1: THE 35 U.S.C. § 112, FIRST PARAGRAPH REJECTION FOR INDEPENDENT CLAIMS 3, 18, AND 33.

ISSUE #2: THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION FOR INDEPENDENT CLAIMS 3, 18, AND 33.

ISSUE #3: THE 35 U.S.C. § 103(a) REJECTION FOR INDEPENDENT CLAIMS 3, 18, AND 33, BASED ON THE 802.1D SPECIFICATION IN VIEW OF VISWANATH.

VII. ARGUMENTS

THE 35 U.S.C. § 112, FIRST PARAGRAPH REJECTION FOR INDEPENDENT CLAIMS 3, 18, AND 33.

In summary, Appellants respectfully submit that the specification of the present Application clearly discloses to one ordinary skill in the art, "*said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows; and the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address,*" (emphasis added by Appellants) as recited in claim 3, and similarly recited in claims 18 and 33.

The Examiner alleges that the specification provides no support for "*said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows; and the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address,*" (emphasis added by Appellants) as recited in claim 3, and similarly recited in claims 18 and 33. The Examiner, however, is clearly incorrect.

That is, contrary to the Examiner's allegations, at least Figs. 38-40 and corresponding description, and more specifically page 4, lines 12-16; page 5, lines 5-12; page 62, lines 10-13; page 109; line 25 – page 110, line 1; page 113 lines 13-27; and page 114, lines 11-14 of the specification of the present Application clearly disclose the aforementioned features of the claimed invention.

For example, the specification of the present Application on page 113 lines 13-27, referring to exemplary Figs. 38-40, discloses:

> "*In this embodiment, even when the asymmetrical flow is flown by sending the learning frame through a path opposite to the path where the main signal frame flows, the learning process can be functioned, the network congestion can be remedied from becoming congestion, and the bandwidth usability can be improved.*
>
> *Conventionally, when a frame having a tag indicating a destination was transferred, it was necessary to previously set an*

> *expansion tag (forwarding tag) to be added for each node according to the destination MAC address.*
>
> *In this embodiment, the expansion tag to be added to each node according to the destination MAC address can be set by containing tag information in the learning frame, and the setting operation can be automated"* (emphasis added by Appellants).

Similarly, with regard to the "*main signal frame*" recited in claims 3, 18, and 33, the specification of the present Application on page 109; line 25 – page 110, line 1, referring to exemplary Figs. 38-40, discloses:

> "*In this example, the frame sent from the client C3 is determined as the ICMP ECHO REQUEST, so that the basic software of the client C1 creates an ICMP ECHO REPLY frame of the destination MAC address c3 and the source MAC address c1 and sends to the node G1. This frame is referred to as the main signal frame in the following description*" (emphasis added by Appellants).

Further, the specification of the present Application on page 4, lines 12-16, referring to exemplary Figs. 38-40, discloses:

> "*a learning frame management unit which refers to a MAC SA table cache to determine whether a learning frame transmission request is made or not, and a MAC SA table cache which stores a source MAC address (MAC SA) which has made a learning frame transmission request*" (emphasis added by Appellants).

Also, the specification of the present Application on page 5, lines 5-12, referring to exemplary Figs. 38-40, discloses:

> "*According to another aspect of the invention, a learning bridge node of a network having plural nodes connected, comprising a learning frame management unit which refers to a MAC SA table cache to determine whether a learning frame transmission request is made or not, and a MAC SA table cache which stores a source MAC address (MAC SA) which has made a learning frame transmission request*" (emphasis added by Appellants).

Accordingly, the specification of the present Application clearly discloses to one ordinary skill in the art, "*said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows; and the MAC SA table cache which stores a source MAC address which has made a*

learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address," (emphasis added by Appellants) as recited in claim 3, and similarly recited in claims 18 and 33.

Therefore, Appellants respectfully traverse the Examiner's findings of facts and respectfully request that the Board to confirm that the specification of the present Application supports the aforementioned features of claims 3, 18, and 33.

ISSUE #2: THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION FOR INDEPENDENT CLAIMS 3, 18, AND 33.

In summary, Appellants respectfully traverse the Examiner's rejection and submit that one of ordinary skill in the art would have sufficiently understand what is being claimed and what the "metes and bounds" of the invention covers.

The Examiner alleges that one with ordinary skill in the art would not have clearly understood "*said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows; and the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address,*" (emphasis added by Appellants) as recited in claim 3, and similarly recited in claims 18 and 33. The Examiner, however, is clearly incorrect.

That is, contrary to the Examiner's allegations, one with ordinary skill in the art would have clearly understood the claimed features, which recite that the learning frame is transmitted to a path opposite to another path in which a main signal frame flows, and main signal frame has the source MAC address and the destination MAC address, as recited in claims 3, 18, and 33.

More specifically, as set forth above, at least Figs. 38-40 and corresponding description, particularly on page 4, lines 12-16; page 5, lines 5-12; page 62, lines 10-13; page 109; line 25 – page 110, line 1; page 113 lines 13-27; and page 114, lines 11-14 clearly disclose the aforementioned features of the claimed invention and the benefits that could be achieved by applying the claimed features.

Particularly, with the claimed features, even when the asymmetrical flow is flown by sending the learning frame through a path opposite to the path where the main signal frame flows, the learning process can be functioned, the network congestion can be remedied from becoming congestion, and the bandwidth usability can be improved (e.g., see Application at page 113, lines 13-27). Further, because the tag information is included in the learning frame, the setting of the forwarding tag to be added can be automated (e.g., see Application at page 114, lines 15-18).

Therefore, Appellants respectfully traverse the Examiner's findings of facts and

respectfully request that the Board to confirm that one of ordinary skill in the art would have sufficiently understand what is being claimed.

ISSUE #3: THE 35 U.S.C. § 103(a) REJECTION FOR INDEPENDENT CLAIMS 3, 18, AND 33, BASED ON THE 802.1D SPECIFICATION IN VIEW OF VISWANATH.

In summary, Appellants respectfully submit that the prior art rejection of record fails to demonstrate all elements of the claimed invention, since there is no demonstration of that "*a MAC forwarding table memory which stores an output port for a destination MAC address and destination tag information corresponding to a virtual local area network (VLAN) tagged Ethernet frame, said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows; and the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address,*" emphasis added by Appellants) as recited in independent claim 3, and similarly recited in independent claims 18 and 33.

Therefore, to begin with, Appellants respectfully traverse the Examiner's findings of facts, as follows:

1. Appellants respectfully submit, however, that the references would not have been combined as alleged by the Examiner and that, even if combined, the alleged combination of references would not teach or suggest each and every feature of the claimed invention.

That is, the 802.1D specification and Viswanath , either alone or in combination (arguendo) fail to teach or suggest, "*said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flow,*" as recited in claim 3, and similarly recited in claims 18 and 33.

The 802.1D specification's deficiencies with regard to claims 3, 18, and 33 are clear and, as admitted by the Examiner, the alleged reference fails to teach or suggest the opposite path (Office Action at page 6, last paragraph).

The Examiner attempts to rely on Viswanath for making up the deficiencies of the 802.1D specification. The Examiner, however, is incorrect.

That is, columns 6 and 7 of Viswanath, upon which the Examiner bases the rejection, merely disclose processing of a frame with VLAN tag and the frame without VLAN tag in an integrated multiport switch. Viswanath, however, in columns 6 and 7 (or anywhere else, for that matter) fails to teach or suggest, "*said destination tag information being included in*

a learning frame that said network transmits to a path opposite to another path in which a main signal frame flow," as recited in claim 3, and similarly recited in claims 18 and 33. Thus, Viswanath fails to satisfy the plain meaning of the claim language, and therefore, fails to teach or suggest the aforementioned feature of the claimed invention.

Since Viswanath does not overcome the deficiencies of the 802.1D specification, the combination of references fails to render the rejected claims obvious.

Moreover, Appellants respectfully submit that these references are unrelated and would not have been combined as alleged by the Examiner. Thus, a person of ordinary skill in the art would not have considered combining these disparate references, absent impermissible hindsight.

Further, Appellants submit that there is no motivation or suggestion in the references or elsewhere (and thus no predictability for one of ordinary skill in the art) to urge the combination as alleged by the Examiner. Indeed, these references clearly do not teach or suggest their combination. Therefore, Appellants respectfully submit that one of ordinary skill in the art would not have combined the references as alleged by the Examiner.

Therefore, Appellants respectfully submit that, one with ordinary skills in the art would not have combined the 802.1D specification with Viswanath, and even if combined, the alleged combination does not teach or suggest (or render obvious) each and every feature of the claimed invention.

2. Appellants also respectfully request that the Board confirm that neither the primary reference the 802.1D specification nor the secondary reference Viswanath teaches or suggests the claimed invention of claim 3, 18, and 33.

Appellants have demonstrated that none of the references relied upon in the rejection of record demonstrates the element of the claimed invention defined in independent claims 3, 18 and 33.

CONCLUSION

In view of the foregoing, Appellants submit that claims 3-5, 7-9, 11-14, 18-20, 22-24, 26-29, 33-35, 37-39, and 41-44, all the claims presently under examination in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest

possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 07/29/10

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VIII. CLAIMS APPENDIX

Claims, as reflected upon entry of the Response under 37 CFR §1.116 filed on May 28, 2010:

1-2. (Cancelled.)

3. (Rejected) A network system for a network having plural nodes connected, wherein a node belonging to said network comprises:

a CPU (Central Processing Unit) executing a learning frame management unit which refers to a source media access control address (MAC SA) table cache to determine whether a learning frame transmission request of a MAC SA has been made; and

a memory system that stores:

a MAC forwarding table memory which stores an output port for a destination MAC address and destination tag information corresponding to a virtual local area network (VLAN) tagged Ethernet frame, said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows; and

the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address.

4. (Rejected) The network system as set forth in claim 3, wherein said nodes comprise:

an aging request acceptance unit which ages said MAC SA table cache, and

a transmission request unit which makes a learning frame transmission request to a CPU.

5. (Rejected) The network system as set forth in claim 4, wherein said nodes have a learning management computer-readable medium encoded with a computer program installed thereon which conducts a learning frame process.

6. (Withdrawn) A network system for a network having plural nodes connected,

wherein a node belonging to said network comprises:

a learning management computer-readable medium encoded with a computer program which conducts a learning frame process; and

a software table stored in a memory,

wherein a network control computer-readable medium encoded with a computer program uses a set of memory duplicate information to perform an entry search in the software table.

7. (Rejected) The network system as set forth in claim 3, wherein said node has an equipment control computer-readable medium encoded with a computer program installed thereon which conducts a variety of configurations.

8. (Rejected) The network system as set forth in claim 3, wherein said node comprises a frame type judgment unit which judges an input frame.

9. (Rejected) The network system as set forth in claim 3, wherein a node belonging to said network comprises:

an aging control unit which ages an entry to be aged, and

an aging management table which stores an entry to be aged.

10. (Cancelled.)

11. (Rejected) The network system as set forth in claim 3, wherein said node comprises a broadcast table memory which stores an output destination port at a time of broadcasting to a tag.

12. (Rejected) The network system as set forth in claim 3, wherein said node comprises a tag forwarding table memory which stores an output port for a forwarding tag.

13. (Rejected) The network system as set forth in claim 3, wherein said node comprises:

a table stored in a memory;

an aging circuit; and

a forwarding table having a table read/write circuit.

14. (Rejected) The network system as set forth in claim 3, wherein said node comprises a TAG address management table which stores an address of a forwarding tag on a MAC forwarding table memory.

15. (Withdrawn) A network system for a network having plural nodes connected, wherein a node belonging to said network applies a learning function of Ethernet to an asymmetric flow by sending a learning frame through an opposite path to a path where a main signal frame flows.

16-17. (Cancelled.)

18. (Rejected) A learning bridge node of a network having plural nodes connected, said learning bridge node comprising:

a CPU (Central Processing Unit) executing a learning frame management unit which refers to a source media access control address (MAC SA) table cache to determine whether a learning frame transmission request of a MAC SA has been made; and

a memory system that stores:

a MAC forwarding table memory which stores an output port for a destination MAC address and destination tag information corresponding to a virtual local area network (VLAN) tagged Ethernet frame, said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows; and

the MAC SA table cache which stores a source MAC address which has made a learning frame transmission request, said main signal frame having said source MAC address and said destination MAC address.

19. (Rejected) The learning bridge node as set forth in claim 18, comprising:

an aging request acceptance unit which ages a MAC SA table cache, and

a transmission request unit which makes a learning frame transmission request to a CPU.

20. (Rejected) The learning bridge node as set forth in claim 19, comprising a learning management computer-readable medium encoded with a computer program which performs learning frame processing.

21. (Withdrawn) A learning bridge node for a network having plural nodes connected, said learning bridge node comprising:

a learning management computer-readable medium encoded with a computer program which performs learning frame processing; and

a software table stored in a memory,

wherein a network control computer-readable medium encoded with a computer program uses a set of memory duplicate information to perform an entry search in the software table.

22. (Rejected) The learning bridge node as set forth in claim 18, comprising an equipment control computer-readable medium encoded with a computer program which makes a variety of configurations.

23. (Rejected) The learning bridge node as set forth in claim 18, comprising a frame type judgment unit which judges an input frame.

24. (Rejected) The learning bridge node as set forth in claim 18, comprising:

an aging control unit which ages an entry to be aged, and

an aging management table which stores an entry to be aged.

25. (Cancelled.)

26. (Rejected) The learning bridge node as set forth in claim 18, comprising a broadcast table memory which stores an output destination port at a time of broadcasting to a tag.

27. (Rejected) The learning bridge node as set forth in claim 18, comprising a tag forwarding table memory which stores an output port for a forwarding tag.

28. (Rejected) The learning bridge node as set forth in claim 18, comprising:

a forwarding table having a table;

an aging circuit; and

a table read/write circuit.

29. (Rejected) The learning bridge node as set forth in claim 18, comprising a TAG address management table which stores an address of a forwarding tag on a MAC forwarding table memory.

30. (Withdrawn) A learning bridge node for a network having plural nodes connected, wherein a learning function of Ethernet is applied to an asymmetric flow by sending a learning frame through an opposite path to a path where a main signal frame flows.

31-32. (Cancelled.)

33. (Rejected) A learning method of a network having plural nodes connected, wherein a node belonging to said network uses a CPU (Central Processing Unit) to:

refer to a source media access control address (MAC SA) table cache to judge whether a learning frame transmission request of a MAC SA has been made, and

store the MAC SA which has made a learning frame transmission request in said MAC SA table cache, and

store an output port for a destination MAC address and a destination tag information corresponding to a virtual local area network (VLAN) tagged Ethernet frame in a MAC forwarding table memory, said destination tag information being included in a learning frame that said network transmits to a path opposite to another path in which a main signal frame flows, said main signal frame having a source MAC address and said destination MAC address.

34. (Rejected) The learning method as set forth in claim 33, wherein said node performs aging of said MAC SA table cache and makes a learning frame transmission request to a CPU.

35. (Rejected) The learning method as set forth in claim 34, wherein said node is provided with a learning management computer-readable medium encoded with a computer program which performs learning frame processing.

36. (Withdrawn) A learning method for a network having plural nodes connected, wherein a node belonging to said network comprises:

a learning management computer-readable medium encoded with a computer program which performs learning frame processing; and

a software table stored in a memory,

wherein a network control computer-readable medium encoded with a computer program uses a set of memory duplicate information to perform an entry search in the software table.

37. (Rejected) The learning method as set forth in claim 33, wherein said node comprises an equipment control computer-readable medium encoded with a computer program which makes a variety of configuration.

38. (Rejected) The learning method as set forth in claim 33, wherein said node discriminates an input frame.

39. (Rejected) The learning method as set forth in claim 33, wherein a node belonging to said network performs aging of an entry to be aged and stores an entry to be aged in an aging management table.

40. (Cancelled.)

41. (Rejected) The learning method as set forth in claim 33, wherein said node stores an output destination port at a time of broadcasting to a tag in a broadcast table memory.

42. (Rejected) The learning method as set forth in claim 33, wherein said node stores an output port for a forwarding tag in a tag forwarding table memory.

43. (Rejected) The learning method as set forth in claim 33, wherein said node comprises:

a forwarding table having a table stored in a memory;

an aging circuit; and

a table read/write circuit.

44. (Rejected) The learning method as set forth in claim 33, wherein said node stores an address of a forwarding tag on a MAC forwarding table memory in a TAG address management table.

45. (Withdrawn) A learning method for a network having plural nodes connected, wherein a node belonging to said network applies a learning function of Ethernet to an asymmetric flow by sending a learning frame through an opposite path to a path where a main signal frame flows.

IX. EVIDENCE APPENDIX

(NONE)

X. RELATED PROCEEDINGS APPENDIX

(NONE)